

PATENT ABSTRACTS OF JAPAN

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(54) IMAGE DISPLAY DEVICE

(57)Abstract:

PURPOSE: To enable adjusting a display screen from an input device such as a keyboard and to accurately obtain a display state required by a user.

CONSTITUTION: When a user inputs a control instruction for adjusting the display screen of a display device 1b from the keyboard connected to a computer body 1a, a control signal superposing circuit 16 forms a control signal corresponding to the control instruction and superposes the formed control signal to a video signal or the vertical flyback period of a synchronous signal generated from a display control circuit 15. A control signal extracting circuit 18 extracts the superposed control signal from the video signal or the synchronous signal outputted from the circuit 16 and outputs the extracted signal. A display control circuit 19 generates an adjustment signal based upon the control signal outputted from the circuit 18 to adjust a video circuit 20 and a deflecting circuit 21.

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CLAIMS

[Claim(s)]

[Claim 1] In the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard, said body of a computer If the control instruction for adjusting the display screen of said display unit is inputted from said input unit Based on this control instruction, create a control signal, and it superimposes on the video signal or synchronizing signal for driving said display unit generated independently. It has a superposition means to output to said display unit. Said display unit An extract means to extract and output said control signal on which it was superimposed from said video signal or synchronizing signal outputted from said superposition means, The image display device characterized by having generated the adjustment signal based on said control signal outputted from this extract means, and having the control means which adjusts other predetermined means in said display unit.

[Claim 2] In an image display device according to claim 1 said body of a computer It has CPU and a signal generation means to generate a Horizontal Synchronizing signal and a Vertical Synchronizing signal as said synchronizing signal while generating said video signal. Said superposition means The holding circuit holding said control instruction which is inputted from said input unit and sent through said CPU, The shift register circuit which incorporates the contents of said holding circuit on the basis of said Vertical Synchronizing signal, Until said counting circuit carries out predetermined value counting the counting circuit which carries out predetermined value counting of said Horizontal Synchronizing signal on the basis of said Vertical Synchronizing signal, and on the basis of said Vertical Synchronizing signal The gate circuit which supplies said Horizontal Synchronizing signal as a read-out clock of said shift register circuit, The level-conversion circuit which doubles the level of the signal read from said shift register circuit with the level of the video signal generated with said signal generation means, the image display device characterized by for the output period of said gate circuit choosing the output of this level-conversion circuit, and for

the other period coming out with the selection circuitry which chooses said video signal, and being constituted.

[Claim 3] In an image display device according to claim 1 said display unit While having a video circuit and a deflection circuit, said control means By the address information contained in said control signal which was equipped with two or more digital to analog circuits, and was outputted from said extract means A predetermined digital to analog circuit is chosen out of said two or more digital to analog circuits. By this digital to analog circuit The image display device characterized by changing into control voltage or an adjustment current, and adjusting said video circuit and/or deflection circuit by making into said adjustment signal the control data contained in said control signal.

[Claim 4] In an image display device according to claim 1 said display unit While having a video circuit and a deflection circuit, said control means It has a microcomputer, nonvolatile memory, and two or more digital to analog circuits. To the power up of said display unit Said microcomputer reads the control information stored in said nonvolatile memory, and it is impressed by the predetermined digital to analog circuit of said two or more digital to analog circuits. When said video circuit and/or deflection circuit are adjusted and said control signal is outputted from said extract means by the output of this digital to analog circuit Said microcomputer processes this control signal and it is impressed by the predetermined digital to analog circuit of said two or more digital to analog circuits. With the output of this digital to analog circuit The image display device characterized by writing in said nonvolatile memory by making said control signal into said control information while adjusting said video circuit and/or deflection circuit.

[Claim 5] It is the image display device characterized by superimposing said control signal which created said superposition means in the image display device according to claim 1 on the perpendicular blanking period of a video signal among said video signals generated independently.

[Claim 6] In the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard, said body of a computer If the control instruction for adjusting the display screen of said display unit is inputted from said input unit A control signal is created based on this control instruction, and it has a creation means to output to said display unit. Said display unit The image display device characterized by having generated the adjustment signal based on said control signal outputted from said creation means, and having the control means which adjusts other predetermined means in said display unit.

[Claim 7] While performing delivery of said control signal from said creation means within said body of a computer to said control means in said display unit using general interfaces, such as RS-232C and GP-IB, in an image display device according to claim 6, for said creation means a signal input means The image display device characterized by forming a signal output means in said control means, respectively, and enabling it to send the information about the situation of said display unit of

operation to said body of a computer from said display unit through said general interface.

[Claim 8] In the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard, said body of a computer With the image data for performing image display to the display unit which created the control signal based on this control instruction, and was created independently, if the control instruction for adjusting the display screen of said display unit is inputted from said input device It has a display process means to output to said display unit. Said display unit While creating a video signal and a synchronizing signal based on said image data outputted from said display process means The image display device characterized by having generated the adjustment signal based on said control signal outputted from said display process means, and having the control means which adjusts other predetermined means in said display unit.

[Claim 9] It is the image display device characterized by controlling other predetermined means in said display unit, and changing this display unit into a non-display condition or the condition near it when renewal of a predetermined period of said image data to which said control means was outputted from said display process means in the image display device according to claim 8 is not carried out.

[Claim 10] In the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard, said body of a computer If the control instruction for adjusting the display screen of said display unit is inputted from said input unit A control signal is created based on this control instruction, and it has a modulation means to modulate this control signal and to superimpose on AC power supply. Said display unit A recovery means to extract said control signal on which it was superimposed from said AC power supply, to restore, and to output, The image display device characterized by having generated the adjustment signal based on said control signal outputted from this recovery means, and having the control means which adjusts other predetermined means in said display unit.

[Claim 11] In the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard, said body of a computer and display unit While inputting some or all of an instruction that is outputted from said input device, respectively, said display unit A creation means to create and output a control signal based on this control instruction when the instruction inputted from said input device is the control instruction for adjusting the display screen of said display unit, The image display device characterized by having generated the adjustment signal based on said control signal outputted from this creation means, and having the control means which adjusts other predetermined means in said display unit.

[Claim 12] The instruction inputted by this exclusive key while having the exclusive key for said input unit to input said control instruction into dedication in the image display device according to claim 11 is an image display device characterized by being inputted into said display unit at least.

[Claim 13] It is the image display device characterized by stopping the number of the path cords between said input devices and display units by performing transmission of said instruction to a display unit from said input device in an image display device according to claim 11 using infrared radiation or an electric wave.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the image display device which improved user-friendliness as adjustment being possible through the body of a computer especially from input devices, such as a keyboard, in various adjustments, such as a display size of the screen in a display unit, and a location, brightness, about the image display device which consists of an input device, the body of a computer, and display units, such as a keyboard.

[0002]

[Description of the Prior Art] In display units, such as current and a computer terminal, the display position of a screen, and a display size and the deviation frequency of a video signal which should be displayed are various. For this reason, the display unit which can respond to various kinds of video signals (video signal) by one set as display units, such as a computer terminal, has come to be used.

[0003] There are some which are going to offer the optimal screen display for every various kinds of a video signal using a microcomputer, Memory LSI, etc. as this kind of a display unit, and the thing of a publication etc. can be mentioned to JP,1-321475,A as such a conventional example, for example.

[0004] The memory which has memorized the display position and display-size information on a screen for every class of video signal is beforehand controlled by a microcomputer etc., the display position and display-size information on the optimal screen according to an input video signal are read from that memory, and the deflection circuit of a display unit etc. is controlled by this conventional example based on that read information. Moreover, since the information corresponding to the above-mentioned memory is not held when the video signal inputted into the display unit is not a known thing, the adjustment switch arranged on the front face of a display unit etc. is operated, and coordinating information, such as a display position of a screen and a display size, is inputted. Based on this input, control circuits, such as the above-mentioned microcomputer, create control information, such as a deviation, and adjustment is performed.

[0005] Although the above-mentioned conventional example tends to obtain the

optimal screen display according to an input video signal by the display unit side, it has some which control from the body side of a computer and switched the display condition as other conventional examples, and can mention the thing of a publication etc. to JP,2-60193,B as such a conventional example.

[0006] In this conventional example, the body of a computer superimposed and outputted the distinction pulse to the blanking period of a video signal, and the display unit has switched the deviation frequency based on that distinction pulse.

[0007]

[Problem(s) to be Solved by the Invention] Between the two above-mentioned conventional examples, in the former conventional example, since all control of the display position of a screen, a display size, etc. was managed by the display unit side, when the need for adjustment or a demand arose, it needed to lift the hand from input devices, such as a keyboard connected to the body of a computer, one by one, needed to extend and operate the hand to the adjustment switch of a display unit etc., and had troublesomeness in respect of user-friendliness.

[0008] Moreover, in the latter conventional example, although it could be operated from input units, such as a keyboard connected to the body of a computer, since a deviation frequency was only switched only with binary, there was a trouble that the display condition which the user of a computer needs could not be acquired enough.

[0009] Then, even if the purpose of this invention solves the trouble of the above-mentioned conventional technique and it does not extend a hand to the adjustment switch of a display unit etc., it can adjust the display screen from input units, such as a keyboard which is at hand, and is to offer the image display device which can moreover acquire exactly the display condition which a user needs.

[0010]

[Means for Solving the Problem] In order to solve the above-mentioned trouble, in this invention, in the general computer system, a superposition means to superimpose the control signal of a display screen on a video signal or a synchronizing signal is established in the body of a computer, and an extract means to extract the control signal on which it was superimposed in the display unit, and the control means which adjusts a display condition with the extracted control signal were established.

[0011] Or a creation means to create a control signal and to output by the predetermined method in the body of a computer is established, and the control means which adjusts a reception display condition for this control signal was established in the display unit.

[0012] Or a display process means to both output the created image data and the control signal of a display screen to a display unit in the body of a computer in the form of a digital signal was established, in the display unit, an analog video signal and a synchronizing signal are created from the above-mentioned image data, and the control means which outputs the adjustment signal which adjusts the predetermined part of a display unit was established from the control signal.

[0013] Or a modulation means to superimpose the control signal of the display screen on the AC power supply for operating the body of a computer is established in the body of a computer, and a recovery means to extract the modulated control signal, and the control means which adjusts the internal circuitry of a display unit with the control signal from a recovery means, and obtains the predetermined display screen were established in the display unit.

[0014] furthermore -- or a display unit receives the control signal from input devices, such as a keyboard, as it is, and an instruction discernment means to identify the control signal concerning adjustment of the display screen, and the control means which adjusts the display screen by the signal from this instruction discernment means were established in the display unit.

[0015]

[Function] The control signal of a display unit is superimposed on the video signal or synchronizing signal outputted from the body of a computer, and when the instruction into which the superposition means within the body of a computer was inputted from input devices, such as a keyboard, is related with adjustment of the display screen of a display unit, by the display unit side, the control signal with which it was superimposed on the extract means is taken out, and a control means adjusts the internal circuitry of a display unit according to this control signal, and obtains a desired screen display.

[0016] Or a creation means creates the control signal which met the control instruction of the display screen from input units, such as the above-mentioned keyboard, and outputs it through a permanent connection line, and if said control signal is inputted, the control means by the side of a display unit will adjust the predetermined part of the internal circuitry of a display unit according to the control signal, and will adjust a display screen.

[0017] Or a display-processing means processes the drawing instruction created by CPU within the body of a computer, creates the image data for performing graphic display, also creates the control signal of a display screen further, and outputs image data and a control signal to a display unit with the predetermined method of digital signal transmission and reception. Moreover, a control means creates an adjustment signal [as opposed to the internal circuitry of reception, a video signal and a synchronizing signal and a display unit for the image data and control signal from said display process means].

[0018] Or a modulation means creates the control signal of the display screen from the information about adjustment of the display screen, or an instruction, superimposes the control signal on the AC power supply supplied to the body of a computer, and transmits a control signal. A recovery means extracts the control signal on which it was superimposed by said modulation means. A control means adjusts the predetermined part of the internal circuitry of a display unit with the control signal from said recovery means, and adjusts the display screen.

[0019] furthermore -- or an instruction discernment means discriminates the thing about adjustment of the display screen from input units, such as a keyboard, among the signals which come directly, and creates the control signal for adjustment. According to the control signal from said instruction discernment means, a control means adjusts the predetermined part of the internal circuitry of a display unit, and adjusts the display screen.

[0020]

[Example] Hereafter, the example of this invention is explained using drawing. Drawing 1 is the block diagram showing the 1st example of this invention. In this drawing, 1a shows the body of a computer. 11 in this CPU, The keyboard controller which processes the various instructions into which 12 is inputted from the keyboard (not shown) connected to body of computer 1a, Input/output port for 13 to make a memory circuit and for 14 make connection with a peripheral device, the control signal superposition circuit which superimposes a control signal on the display-control circuit which generates a video signal and a synchronizing signal for 15 to drive a display unit, the video signal with which 16 was outputted from the display-control circuit 15, or a synchronizing signal, and 17 -- a floppy disk drive circuit -- it comes out. moreover, a cathode-ray tube for a video circuit and 21 to display a deflection circuit and for the display control circuit which generates the adjustment signal over a predetermined circuit, and 20 display an image based on the control signal extract circuit which extracts said control signal, and the control signal with which 19 was extracted by the control signal extract circuit 18, from the video signal with which 1b shows the display unit and 18 was outputted from the control signal superposition circuit 16 in this, or a synchronizing signal, as for 22 -- it comes out.

[0021] Actuation of drawing 1 is as follows. In body of computer 1a, the part except the control signal superposition circuit 16 is the same as that of general configurations, such as the conventional personal computer and a workstation.

[0022] First, if the user of a computer inputs the control instruction for adjusting the display screen of display unit 1b from the keyboard connected to body of computer 1a, the keyboard controller 12 carries out digital coding of the control instruction, and after that, CPU11 will recognize the control instruction and will control the control signal superposition circuit 16.

[0023] In the control signal superposition circuit 16, the control signal corresponding to said control instruction is created, and it superimposes on the vertical-retrace-line period of the video signal for driving display unit 1b generated in the display-control circuit 15, or a synchronizing signal.

[0024] Next, while the control signal extract circuit 18 of display unit 1b extracts the control signal on which it was superimposed from the video signal or synchronizing signal outputted from the control signal superposition circuit 16 and outputs to the display control circuit 19, a video signal is outputted to a video circuit 20, and a synchronizing signal is outputted to a deflection circuit 21, respectively.

[0025] In the display control circuit 19, the adjustment signal over a video circuit 20 and a deflection circuit 21 is generated based on the inputted control signal, and a video circuit 20 and a deflection circuit 21 are adjusted to it. Thus, adjustment of the display screen is performed and a computer user asks for the image displayed on a cathode-ray tube 22.

[0026] Drawing 2 is the block diagram showing one example of the control signal superposition circuit 16 of drawing 1, and drawing 3 is the wave form chart showing the wave of the important section signal of drawing 2. In drawing 2, the counter circuit where an address decoder, the level-conversion circuit where in a data latch circuit and 163 a shift register circuit, and 165 and 170 change an AND circuit, and, as for 166, the edge detector of a pulse and 164 change [162] signal level, and 167 carry out an analog switch, and, as for 168, 161 carries out 17-piece counting of the clock pulse, and 169 are set-reset type flip-flop circuits (henceforth a RSFF circuit).

[0027] Actuation of this drawing is as follows. If the user of a computer inputs the control instruction for adjusting the display screen of display unit 1b from the keyboard connected to body of computer 1a as mentioned above, the keyboard controller 12 carries out digital coding of the control instruction, and after that, CPU11 will recognize the control instruction and will send control data through a computer bus to the control signal superposition circuit 16.

[0028] An address decoder 161 makes the data latch circuit 162 incorporate the control data in the case of control data for the sent control data to adjust the display screen of display unit 1b. Next, the edge detector 163 detects the head part of Vertical Synchronizing signal Vs using Horizontal Synchronizing signal Hs, and outputs this edge detection pulse to a shift register circuit 164, a counter circuit 168, and the RSFF circuit 169.

[0029] a counter circuit 168 -- an edge detection pulse -- a reset signal -- carrying out -- Horizontal Synchronizing signal Hs -- a clock signal -- carrying out -- the -- starting -- coming out -- counting -- if after [a reset-signal input] 17 clock counting is operated and carried out, a carry output will be sent to the reset input terminal of the RSFF circuit 169. Therefore, from the RSFF circuit 169, V gate pulse shown in drawing 3 is outputted. It is superimposed on the control signal over display unit 1b at the high-level period of this V gate pulse.

[0030] On the other hand, a shift register circuit 164 reads the control data currently held at the data latch circuit 162 by the edge detection pulse from the edge detector 163. Next, a shift register circuit 164 performs a shift action by making into a clock signal Horizontal Synchronizing signal Hs with which only the high-level period of V gate pulse is outputted by AND circuit 170, and outputs the control data shown in drawing 3.

[0031] Furthermore, after this control data has a product with Horizontal Synchronizing signal Hs taken in AND circuit 165, it is changed into video-signal level by the level-conversion circuit 166, and is inputted into a switching circuit 167. B

(blue) video signal inputs into the input of another side of a switching circuit 167 among video signals -- having -- said V gate pulse -- a switch switch control signal -- carrying out -- a high-level period -- the output of the level-conversion circuit 166 -- moreover, in the period of the other low level, B video signal can be chosen and B video signal with which it was superimposed on the control signal as shown in drawing 3 can be acquired. Here, although the control signal is superimposed on B video signal with the low vision sensibility of a color, you may superimpose on the other R (red), G (green) video signal, or a synchronizing signal.

[0032] Next, drawing 4 is the block diagram showing one example of the control signal extract circuit 18 of drawing 1, and the display control circuit 19, and drawing 5 is the wave form chart showing the wave of the important section signal of drawing 4.

[0033] drawing 4 -- setting -- 401 -- a distributor and 402 -- a low pass filter (henceforth LPF), and 403 -- a level-conversion circuit, and 404 and 405 -- a buffer and 406 -- 17 count circuits and 407 -- a RSFF circuit, and 408 and 409 -- an AND circuit and 410 -- an inverter and 411 -- a 16-step shift register circuit and 412 -- a decoder circuit and 413 -- a D/A conversion circuit (henceforth DAC), and 414 -- an edge detector -- it comes out.

[0034] Hereafter, actuation of drawing 4 is explained using drawing 5. B video signal from the control signal superposition circuit 16 is inputted into a distributor 401, it is distributed to two, one side is outputted to the video circuit 20 shown in drawing 1 with other video signals, and another side is outputted to LPF402. It is LPF402, and unnecessary frequency components, such as a noise in B video signal, are removed, and after that, B video signal inputted into LPF402 is the level-conversion circuit 403 of the next step, and is changed into digital signal level.

[0035] Moreover, through a buffer 404, it is inputted into the edge detector 414, a head edge is detected there, and Vertical Synchronizing signal Vs is outputted to 17 count circuits 406 and the 407 or 16 steps of RSFF circuits shift register circuit 411 as an edge detection pulse 418 shown in drawing 5, respectively.

[0036] first, Horizontal Synchronizing signal Hs which will be inputted through a buffer 405 in 17 count circuits 406 if reset starts by the edge detection pulse 418 -- counting -- the ** clock -- carrying out -- counting -- it operates and the number **** of 17 clocks and 17 detection pulse are outputted for the standup. Next, in the RSFF circuit 407, the V gate pulse 419 which shows 17 detection pulse to reception and drawing 5 as a reset signal, respectively is created by making the edge detection pulse 418 into a set signal.

[0037] AND circuit 408 takes the product of the output of the level-conversion circuit 403, and V gate pulse from the RSFF circuit 407, and extracts and outputs the control signal 420 on which B video signal was overlapped. Moreover, another AND circuit 409 takes a product with Horizontal Synchronizing signal Hs from the buffer 405 which carried out logic reversal with the above-mentioned V gate pulse and the inverter 410, and makes the clock signal the 16-step shift register circuit 411 and for

DAC413.

[0038] The 16-step shift register circuit 411 resets the contents of maintenance by the edge detection pulse 418, carries out sequential maintenance of said control signal 420 with the clock signal from AND circuit 409, and goes. In a decoder circuit 412, if the first rank of the 16-step shift register circuit 411, two steps, 15 steps, and the 16th step of retention data are decoded and the start bit in a control signal 420 and a stop bit are detected, the load pulse 422 for DAC413 shown in drawing 5 will be outputted. Moreover, the 2nd step of output of the 16-step shift register circuit 411 is used as serial data 421 of DAC413 shown in drawing 5.

[0039] DAC413 is the D/A converter of a type with built-in many channels in a serial data input, according to the DAC control address in the serial data 421 shown in drawing 5, chooses either among two or more built-in D/A converters, and updates a D/A conversion output value with the value of a control data part. Under the present circumstances, serial data 421 is incorporated one by one synchronizing with the clock signal from AND circuit 409, and is incorporated in the standup part of the load pulse 422 from a decoder circuit 412, and data are decided.

[0040] In this way, the control voltage or the adjustment current outputted as an adjustment signal from DAC413 can perform adjustment of the video circuit 20 and deflection circuit 21 which were shown in drawing 1.

[0041] Next, drawing 6 is the block diagram showing other examples of the control signal extract circuit 18 of drawing 1, and the display control circuit 19. In this drawing, 601 is a selector and the read-only memory (henceforth EEPROM) in which an one-chip microcomputer (henceforth a microcomputer) and 603 can write 602, in addition the same number as drawing 4 has the same function.

[0042] Actuation of this drawing is as follows. The part which extracts the control signal on which AND circuit 408 is overlapped in B video signal, and creates the clock signal for the writing of the 16-step shift register circuit 411 by AND circuit 409 is the completely same actuation as the case of drawing 4. By this example, the control signal over display unit 1b sent from the body of computer 1a side shown in drawing 1 is processed using a microcomputer 602.

[0043] First, a microcomputer 602 controls a selector 601, makes the clock signal for the writing from AND circuit 409 choose, and makes the above-mentioned control signal usually write in the 16-step shift register circuit 411. It is inputted as an interrupt signal, and the edge detection pulse from the edge detector 414 controls a selector 601 on a microcomputer 602, and it is made to make it choose the clock signal for read-out from a microcomputer 602 after predetermined time progress at this time.

[0044] The control signal currently held in the 16-step shift register circuit 411 is read one by one by the clock signal for read-out from a microcomputer 602, and is inputted into a microcomputer 602. With a microcomputer 602, when the incorporated signal is a right control signal, control data is outputted to DAC413 and the

predetermined circuit in display unit 1b is adjusted. Moreover, this control data is written also in EEPROM603, that control data is read from EEPROM603 to the power up of display unit 1b etc., and predetermined adjustment is performed to it next time. [0045] Moreover, by this example, ***** control data can be beforehand read by storing the control data in EEPROM603 according to the control signal from the body of computer 1a side. Therefore, the correspondence to every software is also beforehand attained by programming the control information over display unit 1b on [other than the control instruction from a keyboard] the software for the body actuation of a computer.

[0046] In addition, although this example explained the case where the method which superimposes a control signal on the vertical-retrace-line period of a video signal or a synchronizing signal etc. was used as explained above, the direct current level of a video signal itself can also be used as a control signal. In this case, in the control signal extract circuit 18, to reproduce the direct current level of a video signal and what is necessary is just made to adjust the predetermined circuit of display unit 1b according to this electrical-potential-difference value. Moreover, although this example has described the example which adjusts the video circuit 20 and deflection circuit 21 of display unit 1b, of course, it is also possible to control a high-tension-circuit part and to adjust a focus etc.

[0047] Drawing 7 is the block diagram showing the 2nd example of this invention. In this drawing, 1c indicates another body of a computer to be the body of a computer shown in drawing 1 , and 70 is a control signal creation circuit in this. Moreover, 1d of another display units is indicated to be the display unit shown in drawing 1 , and 71 is display control circuit where the display control circuit 19 shown in drawing 1 is another in this. In addition, the same number as drawing 1 shows the same function.

[0048] Hereafter, actuation of drawing 7 is explained briefly. In this drawing, a video signal and a synchronizing signal are outputted from the same display-control circuit 15 as a common personal computer and a common workstation.

[0049] Here, if the user of a computer inputs the control instruction for adjusting the display screen of 1d of display units from the keyboard (not shown) connected to body of computer 1c, the control instruction will be sent to the control signal creation circuit 70 through a computer bus through the keyboard controller 12 and CPU11.

[0050] In the control signal creation circuit 70, the control instruction is held, the control signal corresponding to the control instruction is created, and it outputs to the suitable timing for 1d of display units. As an output method in this case, it is possible to, use the existing interfaces, such as RS-232C, GP-IB, Centronics, and SCSI, for example. Therefore, the corresponding interface circuitry is contained in the control signal creation circuit 70.

[0051] Next, the control signal outputted from the control signal creation circuit 70 is inputted through the above-mentioned interface circuitry contained in the display control circuit 71, and the same interface circuitry, and the display control circuit 71

of display unit 1b generates the control voltage or the adjustment current as an adjustment signal over a video circuit 20 and a deflection circuit 21 based on the control signal, and adjusts a video circuit 20 and a deflection circuit 21 to it.

[0052] In this example, since a control signal is exchanged with a general interface, a communication link bidirectional by 1d side of display units and the body of computer 1c side is possible. For this reason, it is also possible to act as the monitor of whether 1d of display units received the control signal correctly, whether the control state of 1d of display units at present has become, or 1d side of display units is operating normally.

[0053] Drawing 8 is the block diagram showing the 3rd example of this invention. In this drawing, 1e indicates another body of a computer to be the body of a computer shown in drawing 1 and drawing 7, and the display-processing circuit where 81 creates the image data of a display display image in it, and 82 are interface circuitries. 1f of another display units is indicated to be the display unit shown in drawing 1 and drawing 7, and he is the display controller who creates various signals for 83 to drive an interface circuitry and for 84 drive display unit 1b. In addition, interface circuitries (henceforth, I/F circuit) 82 and 83 are the things for delivering and receiving the signal of the display process circuit 81 in body of computer 1e, and the display controller 84 in 1f of display units. Moreover, in addition to this, the same number as drawing 1 and drawing 7 shows the same function.

[0054] Hereafter, actuation of drawing 8 is explained briefly. The image-processing instruction emitted from CPU11 is sent to the display-processing circuit 81 through a computer bus. In the display process circuit 81, the image data of reception and a display display image is created for the image-processing instruction.

[0055] Under the present circumstances, if the user of a computer inputs the control instruction for adjusting the display screen of 1f of display units from the keyboard (not shown) connected to body of computer 1e, that control instruction will be sent to the display-processing circuit 81 through a computer bus through the keyboard controller 12 and CPU11. In the display process circuit 81, if the control instruction is sent, a control signal will be created in the predetermined part outside an image data area.

[0056] Thus, the image data and control signal which were created are outputted towards 1f of display units in the I/F circuit 82 corresponding to a predetermined interface specification, for example, SCSI specification that a transfer rate is large etc., as image information.

[0057] In 1f of display units, the I/F circuit 83 inputs the image information from the I/F circuit 82, and sends to a display controller 84 one by one. A display controller 84 writes the sent image information in an internal memory one by one, and creates each video signal and synchronizing signal of R, G, and B from a part for image data division among the written-in image information. Moreover, if the above-mentioned control signal exists in image information, the control voltage or the adjustment current as an

adjustment signal over a video circuit 20 and a deflection circuit 21 will be generated, and a video circuit 20 and a deflection circuit 21 will be adjusted.

[0058] Furthermore, when the image information written in in predetermined time at the internal memory is not updated, a display controller 84 controls a video circuit 20, is making the amplitude of a video signal into the minimum level, and prevents printing of a cathode-ray tube 22.

[0059] In this example, since the interface between body of computer 1e and 1f of display units has bidirection, it not only sends image data and a control signal from the body of computer 1e side, but the transmission of the signal of the confirmation of receipt, a report of a situation of operation, etc. of it is attained also from 1f side of display units. Moreover, since connection between body of computer 1e and 1f of display units becomes one interface cable, the troublesomeness of connection etc. is cancelable.

[0060] Drawing 9 is the block diagram showing the 4th example of this invention. In this drawing, 1g of another bodies of a computer is indicated to be the body of a computer shown in drawing 1 , drawing 7 , and drawing 8 , and 91 is a modulation circuit in it. a display unit other than the display unit shown in drawing 1 , drawing 7 , and drawing 8 1h -- being shown. -- **** -- the inside of it -- 92 -- a display control circuit and 93 -- a demodulator circuit, and 94 and 95 -- a plug -- it comes out. In addition, the same number as drawing 1 has the same function.

[0061] Actuation of drawing 9 is as follows. If the user of a computer inputs the control instruction for adjusting the display screen of 1h of display units from the keyboard (not shown) connected to 1g of bodies of a computer, the control instruction will be sent to CPU11 through the keyboard controller 12. In CPU11, the control instruction is processed and the control signal corresponding to the control instruction is sent to a modulation circuit 91 through a computer bus. After a modulation circuit 91 modulates the received control signal and superimposes it on an AC power, from a plug 94, it lets power-source Rhine pass and transmits it to 1h side of display units.

[0062] In 1h of display units, if an AC power is supplied from a plug 95 through power-source Rhine, in a demodulator circuit 93, it will restore to the modulated control signal on which the AC power is overlapped, and the original control signal will be reproduced. The reproduced control signal is inputted into the display control circuit 92, and according to the contents of directions of the control signal, the display control circuit 92 generates the control voltage or the adjustment current as an adjustment signal over a video circuit 20 and a deflection circuit 21, and adjusts a video circuit 20 and a deflection circuit 21.

[0063] Thus, in this example, control of 1h of display units can be performed, without increasing the signal line for control signals, in order to transmit the control signal over 1h of display units through power-source Rhine.

[0064] Drawing 10 is the block diagram showing the 5th example of this invention. a

display unit other than the display unit which 1i shows the body of a computer in which a common personal computer and a common workstation are shown in this drawing, and showed 1i to drawing 1 , drawing 7 , drawing 8 , and drawing 9 -- being shown -- **** -- the inside of it -- 101 -- a command discrimination decision circuit and 102 -- a display control unit -- it comes out. 1k shows the keyboard connected to body of computer 1i, and display unit 1j. In addition, the same number as drawing 1 shows the same function.

[0065] Actuation of drawing 10 is as follows. In drawing 10 , actuation of keyboard 1k of the user of a computer inputs a key input signal into display unit 1j as body of computer 1i further. Among these, in display unit 1j, a key input signal is processed in the command discrimination decision circuit 101, and in being control instruction for the key input signal to adjust the display screen of display unit 1j, it takes out as a control signal. According to the contents of directions of the control signal, the display control circuit 102 generates the control voltage or the adjustment current as an adjustment signal over a video circuit 20 and a deflection circuit 21, and adjusts a video circuit 20 and a deflection circuit 21.

[0066] At this example, since the control signal over display unit 1j is not created by body of computer 1i, there is no burden placed on CPU by the side of body of computer 1i. Thus, the user of a computer becomes possible [controlling from keyboard 1k], without touching display unit 1j directly.

[0067] Here, it does not matter as a signal line of the dedication which may distribute the thing linked to body of computer 1i as it is as a signal line connected to display unit 1j from keyboard 1k, or deals with only the control instruction to display unit 1j. In the case of the former, the general thing as keyboard 1k can use as it is. Moreover, in the case of the latter, the exclusive key for display control will be added at keyboard 1k.

[0068] Furthermore, in order to reduce the path cord between keyboard 1k and display unit 1j, the troublesomeness by wiring can be stopped by using the remote control circuit which used infrared radiation etc. Moreover, in this example, although keyboard 1k is used as an input means of control instruction, of course, it is also possible to use input units, such as a mouse, and a touch panel, a light pen.

[0069]

[Effect of the Invention] According to this invention, even if it does not extend a hand to the adjustment switch of a display unit etc., the user of a computer can adjust the display screen from input units, such as a keyboard which is at hand, and, moreover, can acquire exactly the display condition which a user needs. Therefore, improvement in the operability in a computer system and improvement in the user-friendliness of a display unit can be aimed at. Moreover, it is realizable with the configuration of the minimum for ** also about the hardware for control.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the 1st example of this invention.

[Drawing 2] It is the block diagram showing one example of the control signal superposition circuit 16 of drawing 1 .

[Drawing 3] It is the wave form chart showing the wave of the important section signal of drawing 2 .

[Drawing 4] It is the block diagram showing one example of the control signal extract circuit 18 of drawing 1 , and the display control circuit 19.

[Drawing 5] It is the wave form chart showing the wave of the important section signal of drawing 4 .

[Drawing 6] It is the block diagram showing other examples of the control signal extract circuit 18 of drawing 1 , and the display control circuit 19.

[Drawing 7] It is the block diagram showing the 2nd example of this invention.

[Drawing 8] It is the block diagram showing the 3rd example of this invention.

[Drawing 9] It is the block diagram showing the 4th example of this invention.

[Drawing 10] It is the block diagram showing the 5th example of this invention.

[Description of Notations]

1a, 1c, 1e, 1g, 1i [-- A control signal extract circuit, 19, 71 92,102 / -- A display control circuit, 70 / -- A control signal creation circuit, 81 / -- A display process circuit, 84 / -- A display controller 91 / -- A modulation circuit 92 / -- A demodulator circuit 1k / -- A keyboard 101 / -- Command discrimination decision circuit.] -- The body of a computer, 1b, 1d, 1f, 1h, 1j -- A display unit, 16 -- A control signal superposition circuit, 18
